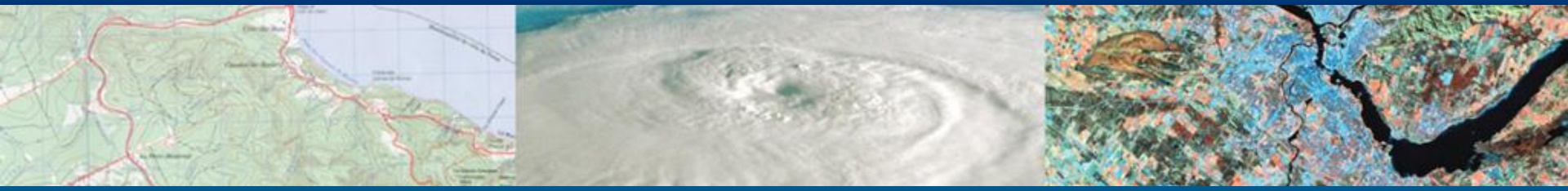
GeoConnections

MAPPING THE FUTURE TOGETHER ONLINE

CARTOGRAPHIONS L'AVENIR EN LIGNE

GéoConnexions

Canadian Geospatial Data Infrastructure and GeoConnections



GeoNorth 2009

Fairbanks, Alaska

Aug. 4-6, 2009

Canadian Geospatial Data Infrastructure

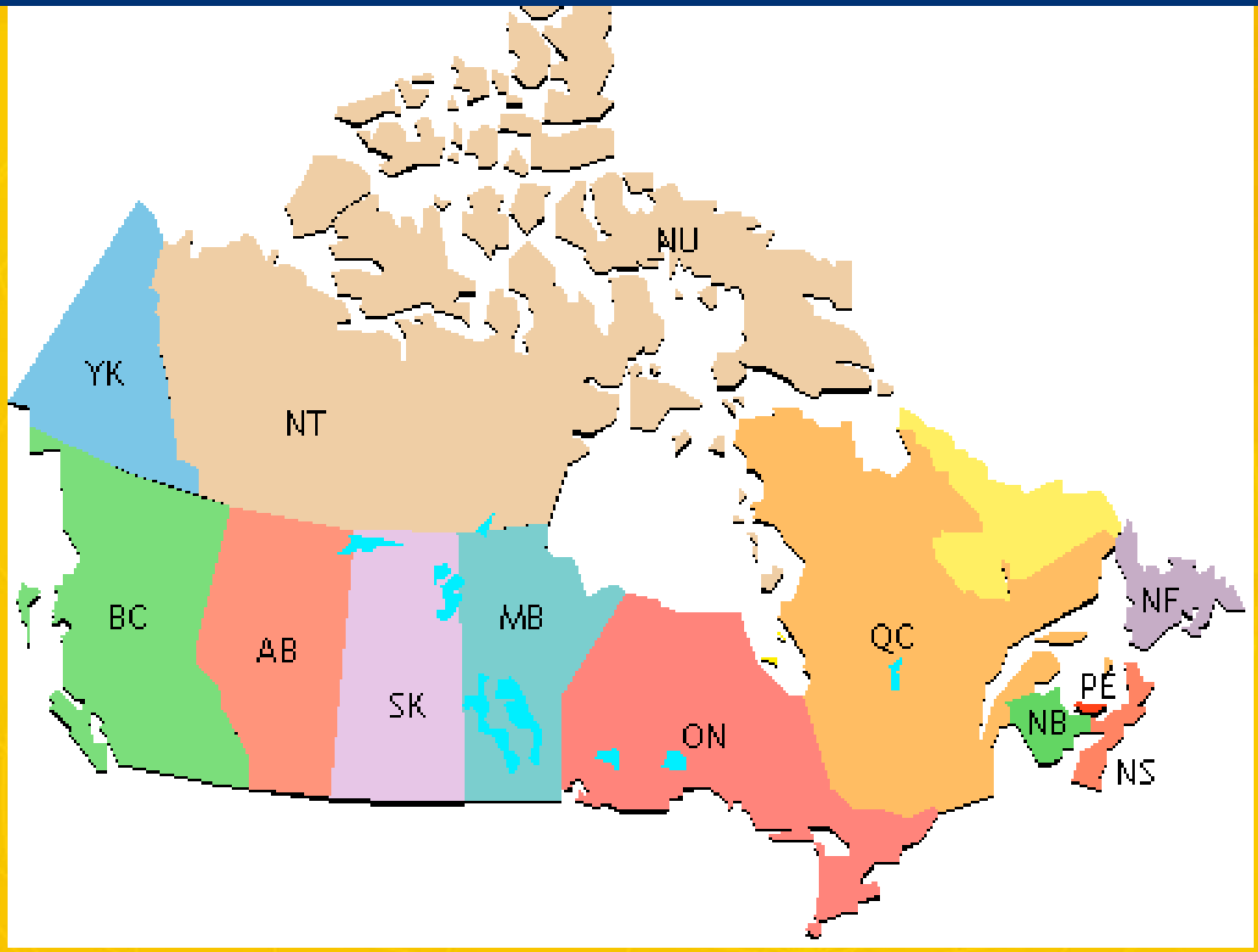
Infrastructure canadienne de données géospatiales

Canada

Outline

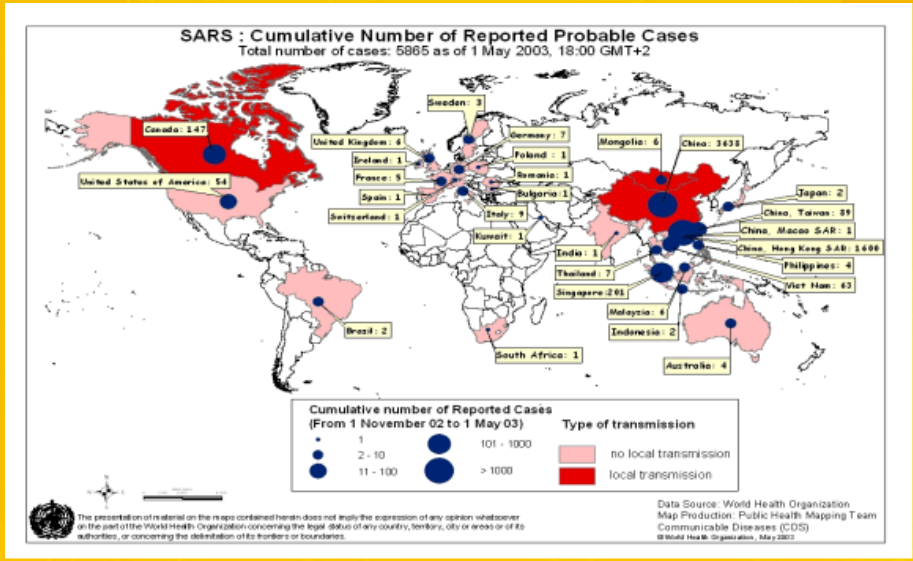
- Canadian Geospatial Data Infrastructure (CGDI)
- GeoConnections Program
- Case Study
- Closing Remarks

About Canada



Why do we need Spatial Data Infrastructures?

- Issues are becoming increasingly global/national in scope and require inter-jurisdictional cooperation…



Geospatial Information that is shared through all levels of government is a key tool for decision support in addressing these issues.

Brief History of the Canadian Spatial Data Infrastructure

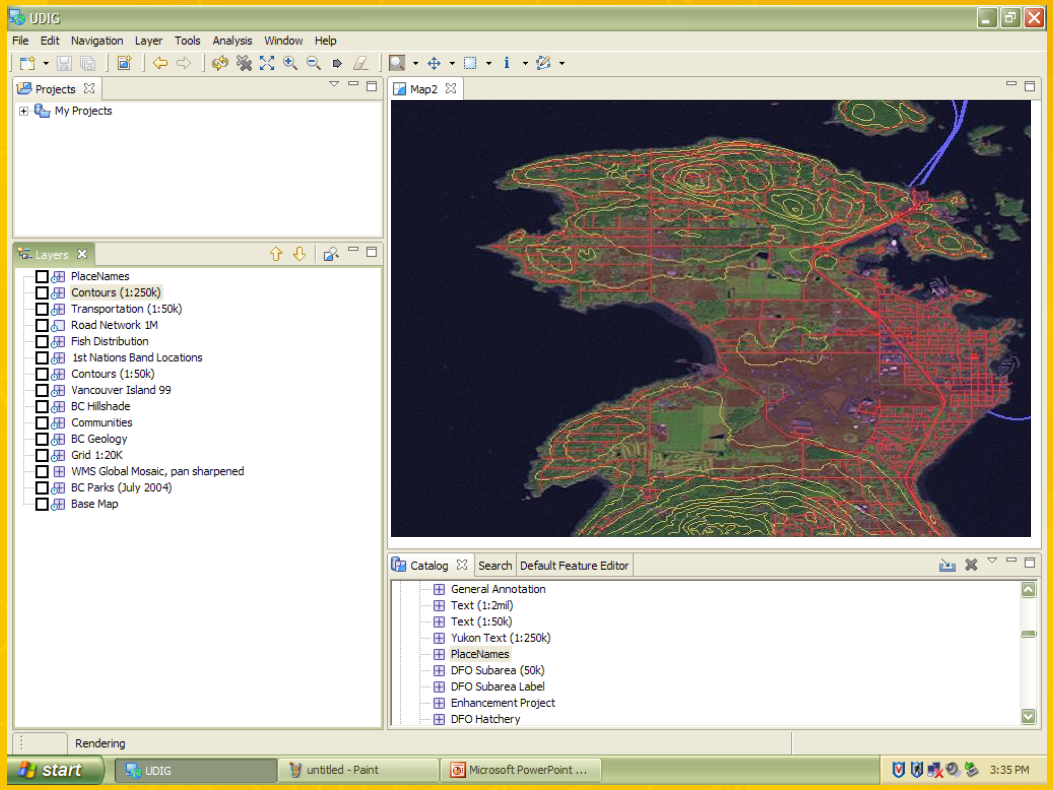
- For decades, the Canadian Federal, Provincial and Territorial Governments have recognized the importance of harmonizing their mapping resources to increase efficiencies, reduce duplication and provide easy access to publicly held geospatial information.
- In the mid 1990's, this multi-jurisdictional collaboration fuelled the vision and mission for a spatial data infrastructure for Canada.
- The Federal Government Budget of1999 established the GeoConnections Program to build the Canadian Geospatial Data Infrastructure (CGDI).
- The CGDI has become an important Canadian public asset enabling the access to and sharing of geospatial information and services through the Internet.

FOUNDATIONAL DATA
(Satellite Imagery)

LOCAL GOVT DATABASE
(Road network data)

THEMATIC DATA
(Non-government or
Private sector data)

A fully distributed vision…



Online Decision Support

Canada

Goals of the Canadian Geospatial Data Infrastructure

1. Provide easier access to historical and up-to-date authoritative geospatial framework data maintained by public agencies throughout Canada.
2. Facilitate access to the leading thematic sources of Canadian geospatial information based on framework data.
3. Increase awareness and understanding of the benefits of the use of geographic information in support of the environment, economy, society and local to global community for the benefit of all Canadians.

Goals of the Canadian Geospatial Data Infrastructure

4. Enable decision-making and policy development that address Canada's priority issues such as health, security and safety, cultural, economic, and natural resources.
5. Foster the development of geospatial standards, specifications and innovative technologies.
6. Foster partnerships and sharing of geospatial information across all sectors, at all levels of government, and at the international level.
7. Foster the development and harmonization of policies in order to protect the interests of Canada's citizens and businesses.

Canadian Geospatial Data Infrastructure

- The CGDI is the backbone of Canadian geospatial information discovery, access, use and delivery:
  - By providing access to Geobase data
  - By organizing Canada's wealth of geospatial information in an easily searchable catalogue.
  - By enabling interoperability through the adoption of recognized standards
  - By ensuring collaboration through strong partnerships with key stakeholders nationally and internationally
  - By identifying and addressing geospatial information exchange barriers through policy leadership
  - By leading the harmonization of geospatial data supporting the development of innovative business decision support technologies

Canadian Geospatial Data Infrastructure

Environment

- Climate Change: monitoring, mitigation and adaptation
- Environmental Assessment
- Land Management
- Biodiversity

Society

- Health
- Security
- Education
- Public Infrastructures

Community

- Local to Global:
- Regional, Municipal, Aboriginal
- Sovereignty
- International Collaboration
- Boundaries

Economy

- Innovation
- New Business
- Growth
- Export

Canadian Geospatial Data Infrastructure Defined

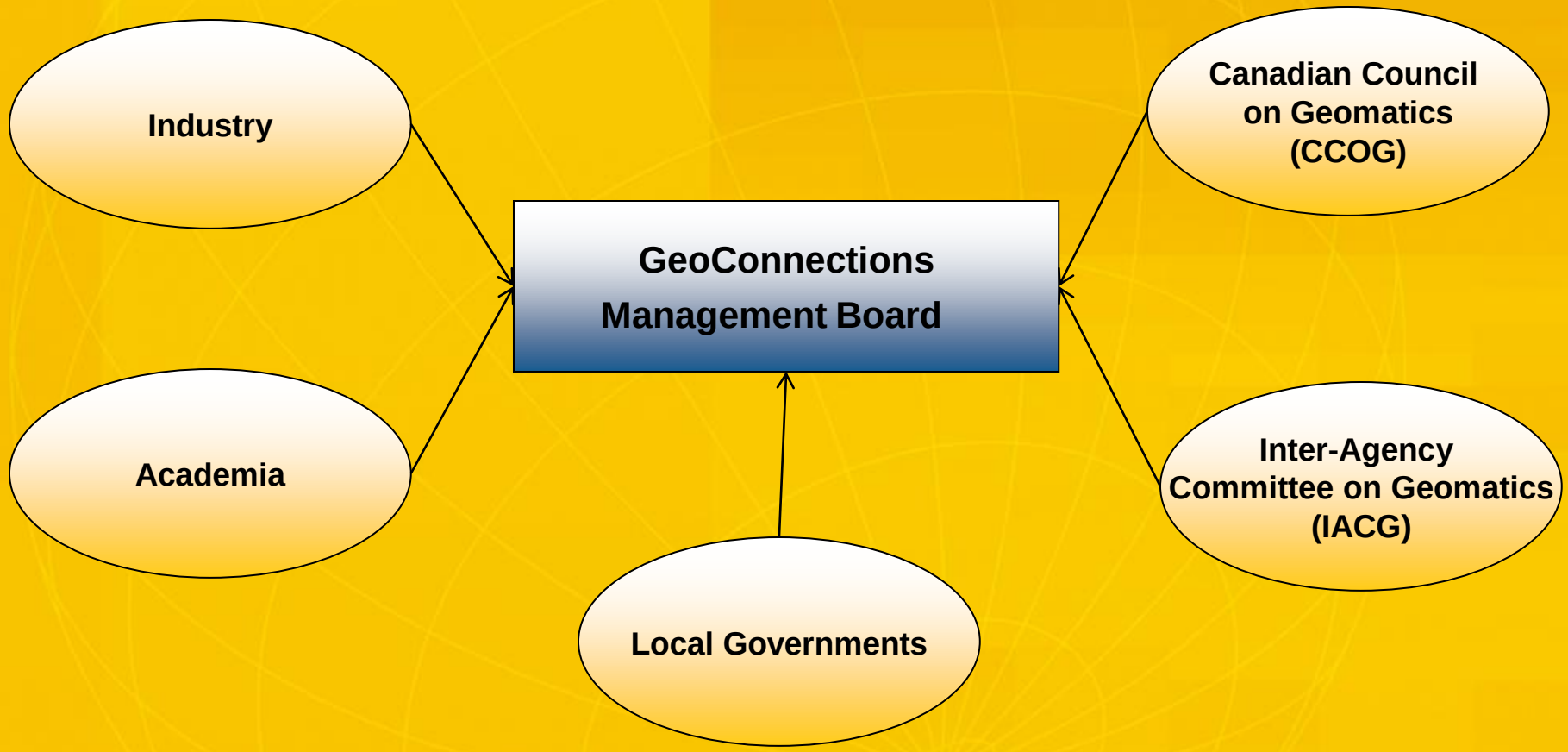
- The CGDI is a network for the effective, efficient discovery and access to Canadian geospatial information, which is achieved through
  - *Interoperability*,
  - *Collaboration*,
  - *Leadership*,
  - *Policies*,
  - *Framework Data*,
  - *Standards* and *Technologies*,
- in order to respond to international, national, regional and local priorities related to the *Economy*, *Environment*, *Society and Community*.

CGDI Component: Leadership/Governance

- The CGDI's shared leadership is comprised of:
  - The Canadian Council on Geomatics (CCOG)
  - The Inter-Agency Committee on Geomatics (IACG)
  - Canadian Industry Representatives
  - Academia Representatives
  - Local Government Representatives

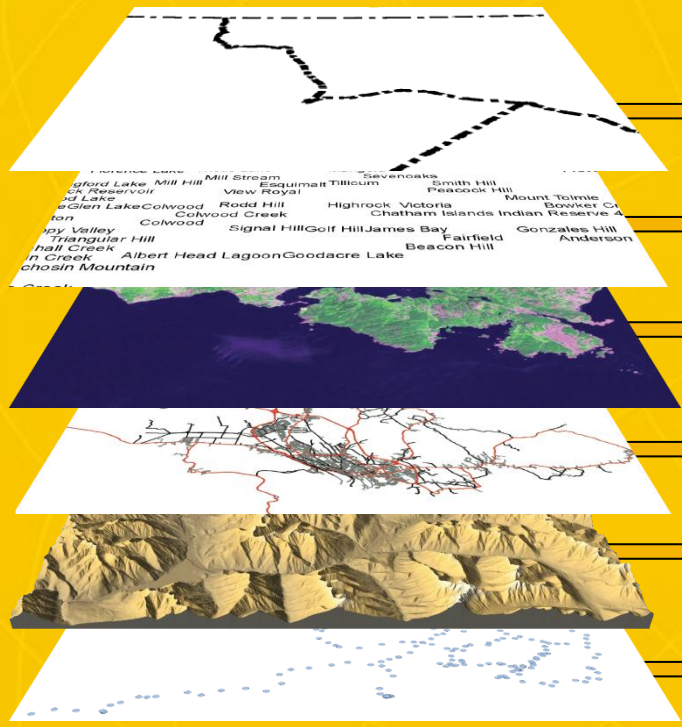
CGDI - GOVERNANCE

- Strong and representative governance is key to the long term sustainability of the CGDI:



CGDI Component: Data Content

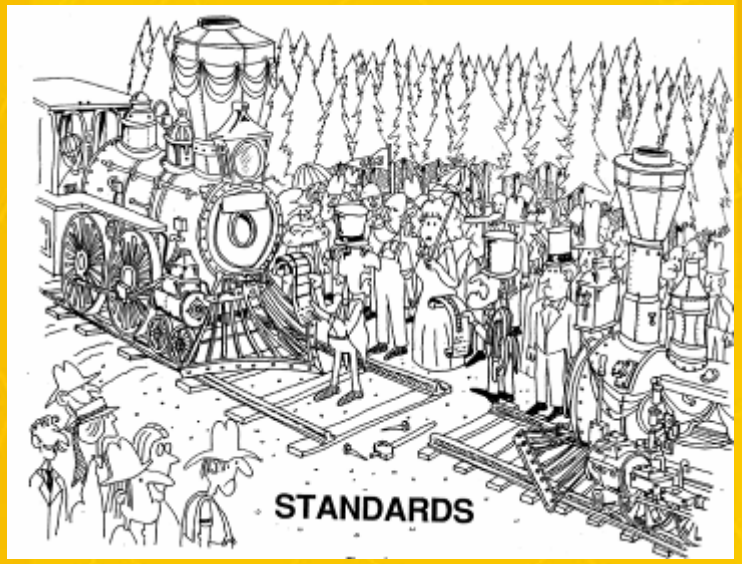
GeoBase: Standardized **national base data**, maintained in partnership, and accessible at no cost to users and without redistribution restrictions



GeoConnections is supporting maintenance of these layers and additional layers.

CGDI Component: Standards

The need for standards



Endorsed standards

GeoConnections endorses international standards for visualizing, accessing and describing geospatial data to facilitate **inter-agency interoperability**

Treasury Board of Canada Secretariat, Standard on Geospatial Data for the Government of Canada

July 03 2009

The **Treasury Board of Canada Secretariat has established the Standard on Geospatial Data for the Government of Canada**. The Standard on Geospatial Data supports the Policy on Information Management and the Policy on the Management of Information Technology of the Government of Canada. The Standard will facilitate interoperability across institutions and increase their ability to identify, understand, use, and share geospatial data. This standard also allows institutions to maximize the reuse of existing mapping and related products.

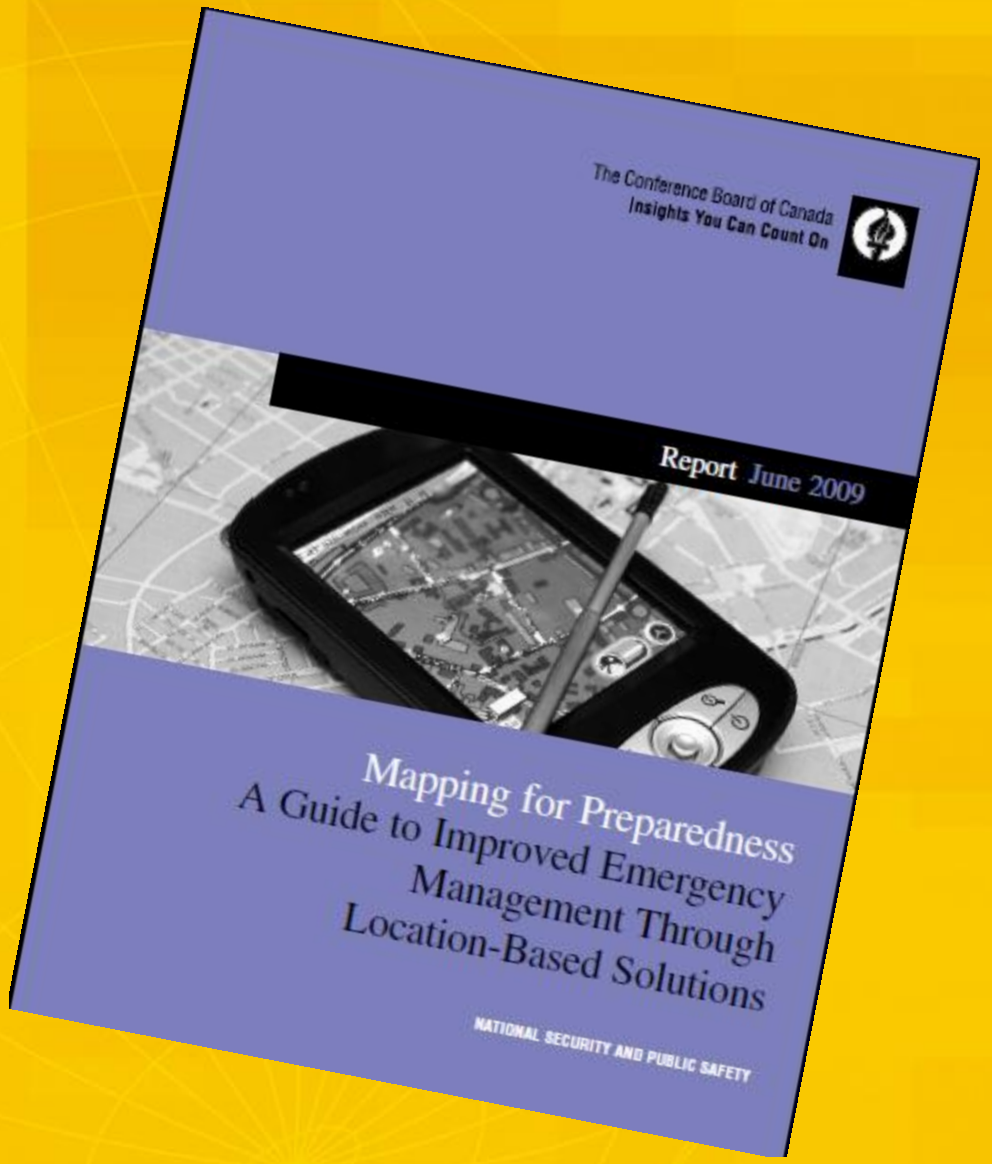
The scope of the standard currently comprises two ISO standards: **ISO 19115 Geographic information - metadata** and **ISO 19128 Geographic information - Web map server interface**. Both standards have been previously endorsed by the national GeoConnections program for use in the Canadian Geospatial Data Infrastructure (CGDI).

The standard came into effect June 1, 2009. **Departments will have until May 31, 2014 to fully implement the standard.**

CGDI Component: Technologies

CGDI Component: Policies

Policy research, development and coordination are essential to the CGCI. They identify barriers and solutions to sharing geospatial information through collaboration between Canada's 14 jurisdictions and key stakeholders.



Building Canada's SDI: The GeoConnections Program

The GeoConnections Program is a **national partnership** program led by Natural Resources Canada that collaborates and partners with all levels of government, private sector, non-government organizations, academia and international organizations in order to build and evolve the **Canadian Geospatial Data Infrastructure**.

Phase 1: Building the CGDI

- **1999 – 2005:**
  - The GeoConnections Program was launched to make Canada's geographic information accessible online by building the CGDI.
  - The Program focused on building the infrastructure and developing examples of how it could be used to benefit Canadians.

Phase 1: Key Accomplishments

- **Established the Canadian Geospatial Data Infrastructure (CGDI):** Through partnerships with industry, developed elements of the operational infrastructure such as advanced technologies and applications that increase access, sharing and use of geographic data.
- **Strengthened Federal-provincial-territorial collaboration**: Negotiated first ever Ministerial Canadian Geomatics Accord with Canadian provinces and territories; achieved common agreement and policy approach on partnership principles and to licensing data to remove policy barriers to data sharing;
- **Created foundational, standardized reference data framework**
- Facilitated the provision of **seamless, up-to-date and maintained GeoBase framework data at no cost to users.**

Phase 1: Key Accomplishments

- **Leveraged investments and developed partnerships**: The federal government has benefited from over $170M in program activity based on its $60M investment through cost-sharing partnerships with industry, academia and provinces/territories, and non-governmental agencies

- **Growing an innovative Canadian geomatics industry**: advancing innovation and growth of the high-tech geomatics sector through partnerships on Internet-applications and advanced technology development (70% of funds expended on industry partnership projects = over $42M)

Phase 2: Program Renewal

2005 – 2010:

- Renewed Government of Canada Program - $60M over 5 years
- Purpose: To improve Canadians' quality of life by helping make geospatial data and technologies available to enhance decision-making in four priority user communities:
  - Public health
  - Public Safety & Security
  - Environment & Sustainable Development
  - Matters of Importance to Aboriginals

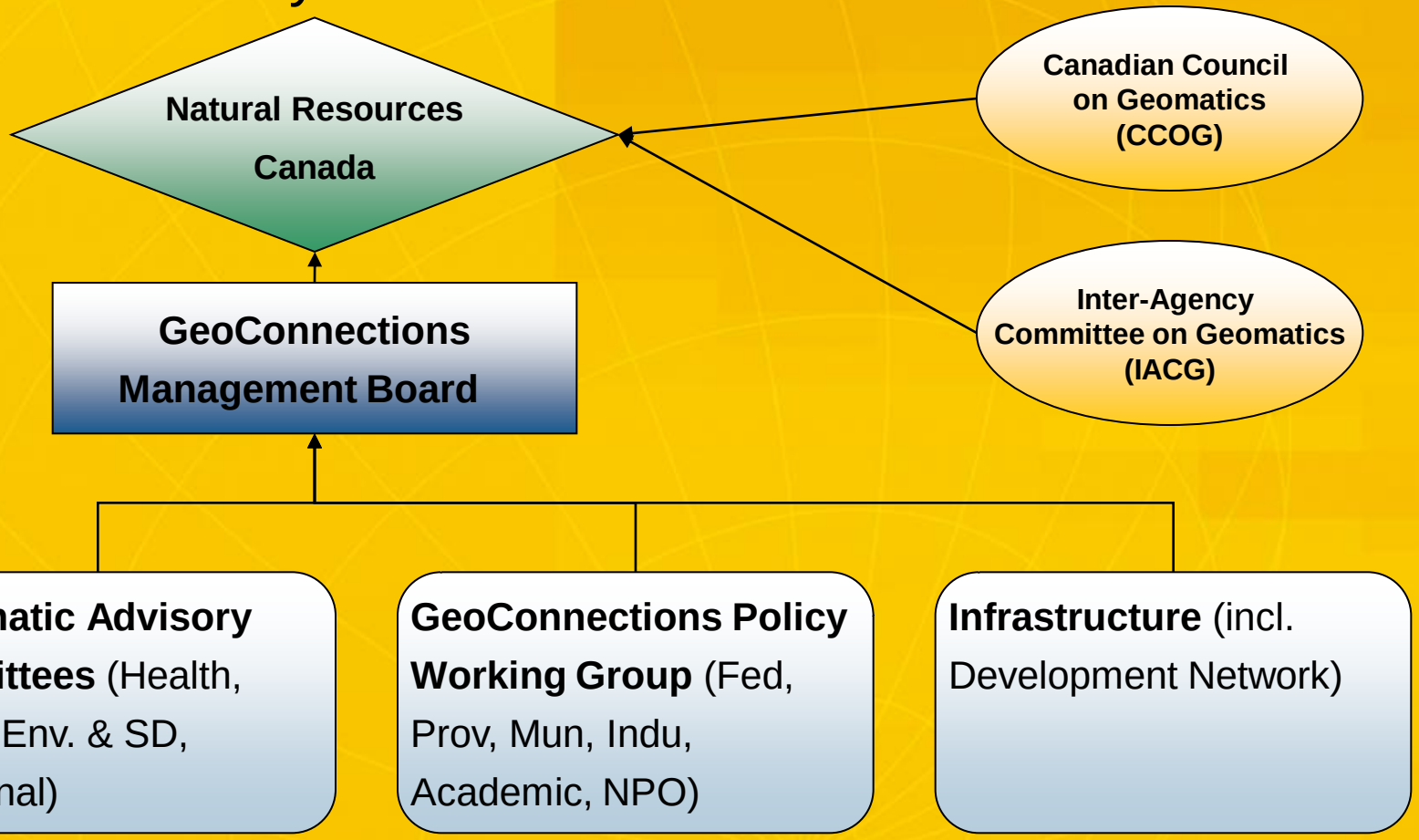
Phase 2: Focus

The new GeoConnections Program is end-user driven:

- Build applications that serve specifically targeted communities of practice;
- Provide the framework and other thematic data with attributes prioritized by these communities of practice;
- Maintain, operate and expand the core infrastructure and standards, as required by users;
- Support consistent geomatics policy development federally and nationally to reduce duplication and improve use of the CGDI

GEOCONNECTIONS - GOVERNANCE

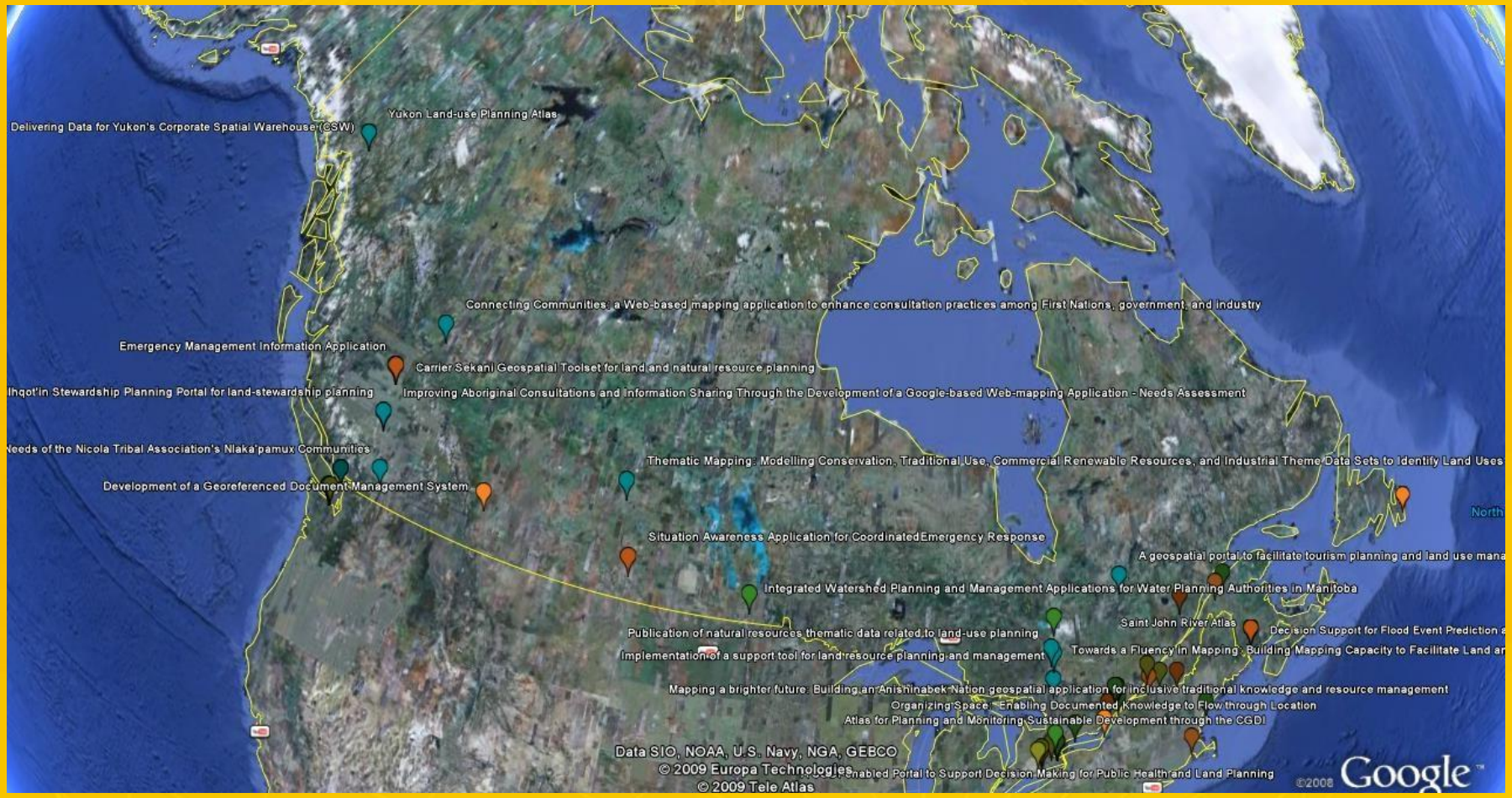
- GeoConnections' Governance is key in supporting the long term sustainability of the CGDI:



CGDI Benefits to Canadians

- **Informed decision-making**: easy access to current information enabling easier integration of information and enabling collaborative activities.
- **Efficiency**: interoperability, by adhering to common and open information standards and specifications. Also reduces duplication of effort.
- **Reduced costs**: applications can be built by reusing existing services and technology components. Standard interfaces simplify interconnection and integration.
- **Usability**: provides reliable access to geospatial information for Canadian governments, businesses and individuals anywhere, anytime.
- **Economic growth**: encourages the profitable export of Canadian technology, products and services and internal growth with increased sales and new business opportunities.

GeoConnections Project Investments Across Canada



www.geoconnections.org has a map showing projects with descriptions.

Case Study: Introduction

Securing Arctic Seabird Sustainability

- A GeoConnections funded partnership project involving:
  - Environment Canada (EC)
  - US Fish and Wildlife Service (USFWS)
  - World Conservation Monitoring Centre (WCMC)
  - Arctic Council's Conservation of Arctic Flora and Fauna (CAFF) Working Group
  - Circumpolar Biodiversity Monitoring Program

ARCTIC COUNCIL

Environment Canada | Environnement Canada

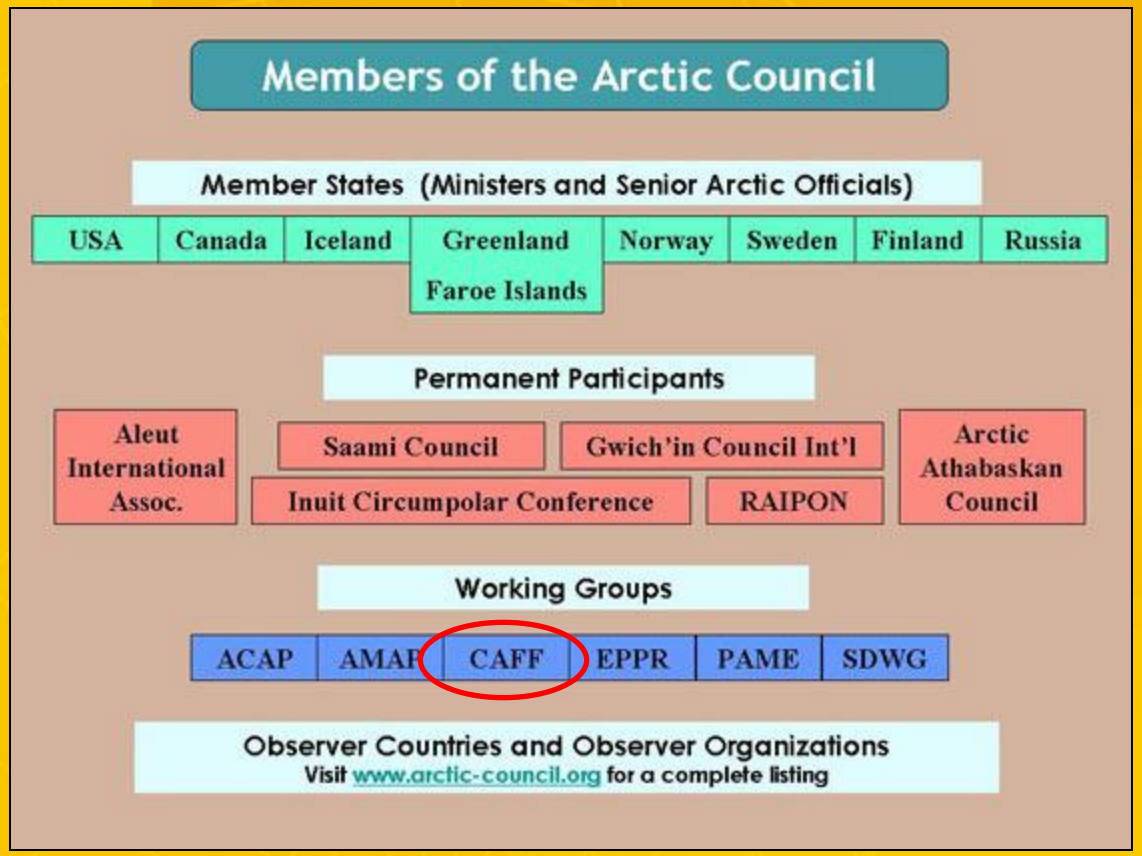
WCMC

CAFF Conservation of Arctic Flora and Fauna

Case Study: Introduction (cont.)

The Arctic Council – A Model of Cooperation and Partnership

- The Arctic Council is a high-level forum between Arctic nations, indigenous communities and other Arctic residents.



Case Study: Background

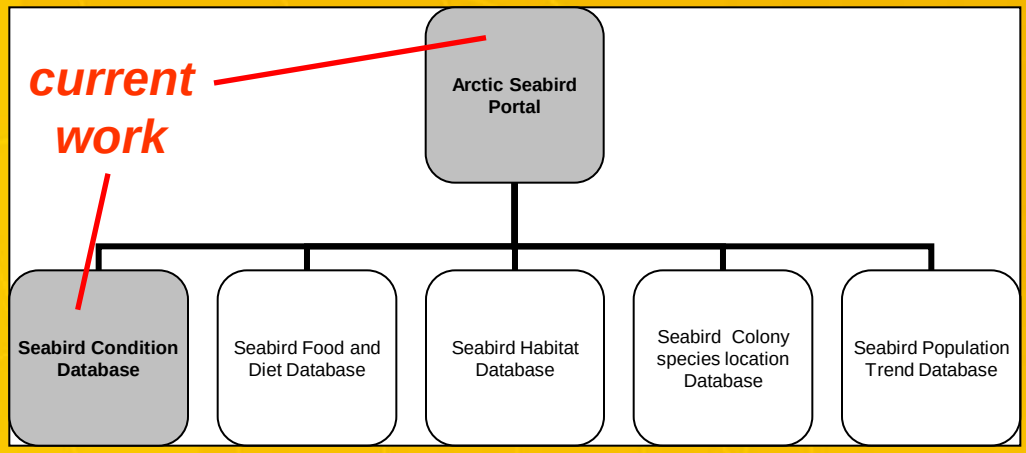
- Seabirds are top predators occupying critical ecological niches and act as indicators of the overall health of the marine ecosystem.
- There is a shared responsibility by all Arctic nations for the conservation and monitoring of seabirds.

- Arctic Council established the Circumpolar Biodiversity Monitoring Program (CBMP) to address the Arctic Climate Impact Assessment's (ACIA) recommendation to enhance long-term Arctic biodiversity monitoring.

Case Study: Project Goals

Primary Goal

- To develop a Seabird Information Network (SIN) that will geospatially display the locations and trends of seabird colony conditions across the Arctic.



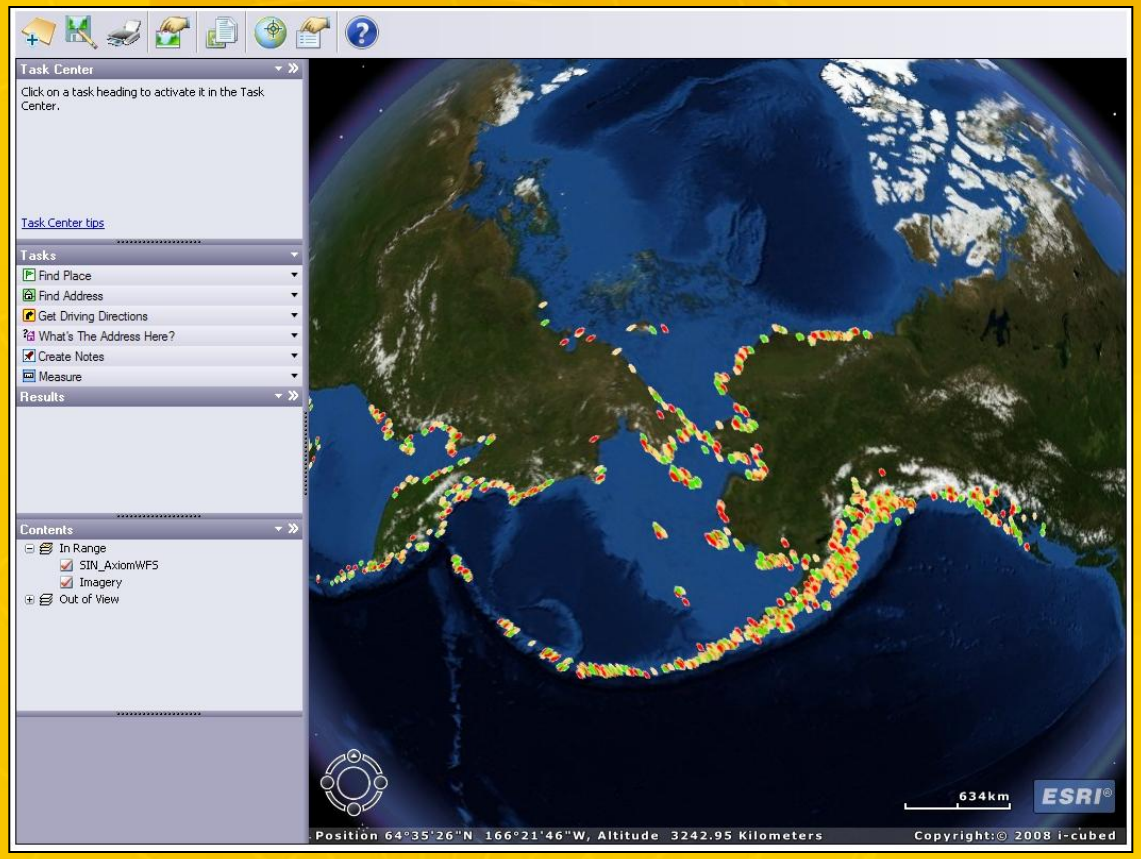
Secondary Goals

- To serve as a template for a pan-Arctic web portal information service.
- To pilot the suitability of this framework to function as the template for caribou, polar bear, vegetation, and marine data portals.

Case Study: Work to Date

Live and Development Servers Established

- Both a live and development portal have been established.
- Project will complete in February 2010.

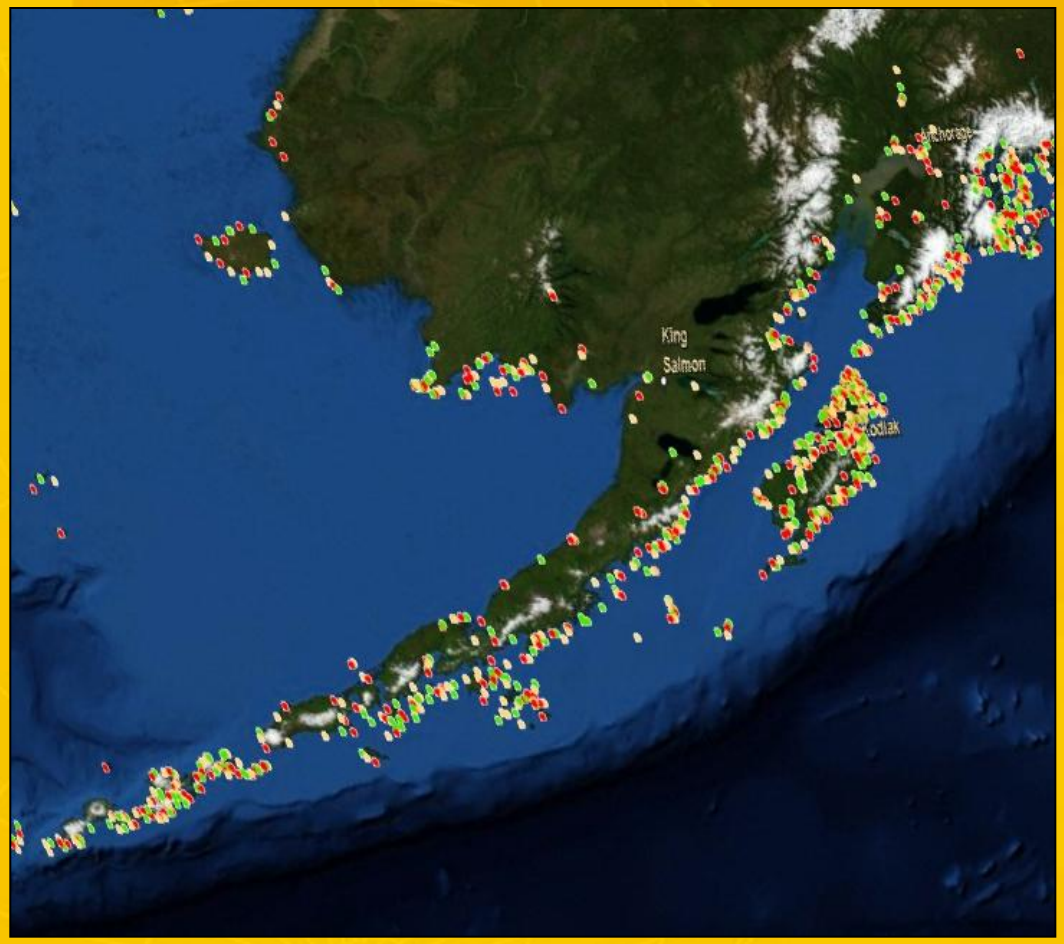


http://development3.unep-wcmc.org/sin/arcgisexplorer.html

Case Study: Work to Date (cont.)

CGDI-Endorsed Standards to be Implemented

- Web Map Service (WMS).
- Web Feature Service (WFS).
- Filter Encoding (FE).
- Geographic Markup Language (GML).
- Geodata Discovery Service.
- Geodata Resource Registry.



Case Study: Benefits

Overall Benefits

- Ensure that land use planning and environmental assessment processes are informed about local Arctic seabird conditions.
- Report on trends and conditions in a timely and efficient manner.
- Ensure that indigenous communities have the latest information when stewarding and managing their traditional territories with current and unbiased information.
- Serve as a mechanism for harmonizing and enhancing monitoring efforts throughout the Arctic.

Case Study: Benefits (cont.)

User Community Benefits

- ***Policy and decision-makers*** will be able to quickly view seabird conditions on a regional, national, or pan-Arctic scale.
- ***Environmental Assessment practitioners*** will be able to provide a pan-Arctic scope which is critical for managing Arctic species.
- The ***scientific community*** will be able to identify and / or investigate the mechanisms driving seabird population trends as well as promote the harmonization of monitoring efforts on a pan-Arctic scale.

Case Study: Sustainability

Maintenance and Development Plans

- USFWS and WCMC have agreed to maintain the data and analysis servers.
- USFWS will continue to develop up to10 other seabird databases.
- Final vision is an Arctic / Global infrastructure for seabird colony conditions, habitat, status, etc.
- Upcoming initiatives will include the interoperable exchange of biological data for other Expert Monitoring Groups (e.g. Caribou).

Case Study: Sustainability (cont.)

Communications

- User community will continue to be informed and involved in project outcomes through the CAFF working group.
- Community and working groups will be informed via newsletters and website updates.
- Updates and information will also be communicated via the portals.

Case Study: Further Information

Contact

Michael Svoboda, Project Manager

Environment Canada

91780 Alaska Highway

Whitehorse YT

Y1A 5B7

michael.svoboda@ec.gc.ca

+1 (867) 667-3939

Closing Remarks

- The Government of Canada's investment to date has created many of the collaborations that have developed new applications of geospatial information.
- As an active member of the OGC, the CGDI endorsed standards enables effective sharing of geospatial data nationally and internationally.
- GeoConnections has successfully supported projects through the project lifecycle (strategic/business plans, user need assessments, implementations).

Contact Information

Jeannine Parent
Manager, Policy Coordination
GeoConnections
Mapping Information Branch
Earth Sciences Sector, Natural Resources Canada
Ottawa, ON

telephone: 1 (613) 943-9811
fax: 1 (613) 947-2410
e-mail: jeaparen@nrcan.gc.ca